WHITEPAPER

WHY THE FUTURE OF THE CLOUD IS OPEN

By Gordon Haff, technology evangelist

EXECUTIVE SUMMARY

Choosing how to build a hybrid cloud is perhaps the most strategic decision IT leaders will make this decade. It is a choice that will determine their organization's competitiveness, flexibility, and IT economics for the next 10 years.

Public clouds have set the benchmark for on-demand access to resources. But most organizations that use public clouds do so in concert with a variety of on-premise computing resources, albeit modernized and increasingly operated in a manner that provides self-service, dynamic scaling, and policy-based automation. Heterogeneous environments, both public and private, are today's face of hybrid cloud.

Whatever the optimal mix for a given organization, a well-planned cloud strategy delivers strategic advantages to the business by redirecting resources from lights-on to innovation. But only an open cloud delivers on the full strategic business value and promise of cloud computing. By embracing open clouds, organizations ensure that their cloud:

- Enables portability of applications and data across clouds.
- Fully takes advantage of existing IT investments and infrastructure and avoids creating new silos.
- Makes it possible to build a hybrid cloud that spans physical servers, multiple virtualization platforms, private clouds, and public clouds running a variety of technology stacks.
- Provides incremental value as they incrementally add new capabilities.
- Puts them in charge of their own technology strategy.

"The shift to hybrid cloud is all but inevitable, so grasp the opportunity."

THE WHAT, THE WHY, AND THE HOW OF HYBRID CLOUD, OSTERMAN RESEARCH, MAY 2016

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INTRODUCTION

"For the foreseeable future, hybrid cloud will remain the dominant model, and enterprises must build cloud infrastructure and services to support its users and develop modern applications with a hybrid world in mind."

GARY CHEN, IDC
PREPARING FOR PRIVATE CLOUD AND HYBRID I.T. WITH RED HAT CLOUD INFRASTRUCTURE, FEBRUARY 2015

When the term "cloud computing" first appeared on the scene, it described a computing utility. The clear historical analog was electricity. Generated by large service providers. Delivered over a grid. Paid for when and in the amount used. This concept was reflected by the early public clouds that delivered raw computing resources in the form commonly called Infrastructure-as-a-Service (IaaS).

Certain characteristics of these public clouds were compelling, relative to traditional aspects of enterprise IT. Cost per virtual machine could be lower. Users, such as business analysts, could use a credit card to get access to IT resources in minutes, rather than waiting months for a new server to be approved and provisioned. All this in turn led to new applications and business services coming online more quickly and reducing the time to new revenue streams.

However, at the same time, most organizations cannot move all of their applications onto public cloud providers. Often this is because of real or perceived concerns around compliance and governance, especially for critical production applications. Nor do public clouds typically provide the ability to customize and optimize around unique business needs.

A private cloud, typically based on OpenStack® technology, provides a proven option for those who want to maintain direct ownership and control over their systems, or a subset thereof. Certain workloads and data storage may be cheaper on-premise. The ability to customize and co-locate compute and data can simplify integration with existing applications and data stores. And the proper handling, including adherence to data locality requirements, of sensitive customer data always needs to be taken into account.

Private cloud implementations often take place alongside IT optimization projects, such as creating standard operating environments (SOE), tuning and modernizing existing virtualization footprints, and improving management and integration across heterogeneous infrastructures.

Whatever the reasons in an individual case, the reality is that most organizations will have a hybrid and heterogeneous IT environment. Keeping such an environment from fracturing into isolated silos requires embracing openness across multiple dimensions.

Fundamentally, an open hybrid cloud is about helping organizations across all industries:

- Build new, composable, integrated cloud-native apps for new revenue streams.
- Develop apps and respond to the market more quickly with DevOps agility.
- Deploy on a scalable and flexible cloud infrastructure that quickly adapts to change.
- Protect the business with management, security, and assurance capabilities.

"With Red Hat Cloud Infrastructure, we can do in 30 minutes what used to take at least a day. With a single user interface, our users can access a seamless self-service portal to manage resources from both their on-premise, private cloud service as well as [Amazon Web Services] AWS."[1]

PROFESSOR YENG CHAI SOH, FOUNDING DIRECTOR OF HIGH PERFORMANCE COMPUTING, COMPUTING CENTRE, NANYANG TECHNOLOGICAL UNIVERSITY

WHY A HYBRID CLOUD?

A hybrid cloud originally just meant a cloud that combined private and public cloud resources. But, as cloud computing has evolved, users think of hybrid in broader terms.

Today, hybrid also covers heterogeneous on-premise resources, including private clouds, traditional virtualization, bare-metal servers, and containers. It encompasses multiple providers and types of public clouds.

In short, IT infrastructures, and the services that run on them, are hybrid across many dimensions. There is a simultaneous requirement in most organizations to both modernize and optimize their software-defined datacenters (SDDC) and deploy new cloud-native infrastructure. Most organizations use services from several public clouds. And there is a widespread need to bridge and integrate across these different infrastructures to allow for consistent processes and business rules, as well as for picking the best infrastructure for a given workload.

However, hybrid should not mean silos of capacity. Adding cloud silos increases complexity rather than reducing it.

This is not to say that we cannot start our journey to a cloud on a subset of infrastructure. In most cases, a pilot project or proof-of-concept using a subset of applications will indeed be the prudent path. The difference is that a proof-of-concept is a first step; a new silo is a dead end.

Taking an open approach to cloud is a key way to avoid a siloed cloud future.

INNOVATION THROUGH OPEN SOURCE

Entire new categories of software are open source by default. That's because the community development model works. Open source underpins the infrastructure of some of the most sophisticated web-scale companies, like Facebook and Google. Open source stimulates many of the most significant advances in the worlds of cloud infrastructures, cloud-native applications, and big data.

Open source enables contributions and collaboration within communities, with more contributors collaborating with less friction. Furthermore, as new computing architectures and approaches rapidly evolve for cloud computing, big data, and the Internet of Things (IoT), it is also becoming evident that the open source development model is extremely powerful because of how it allows innovations from multiple sources to be recombined and remixed in powerful ways. To give just one example, the complete orchestration, resource placement, and policy-based management of a microservices-based, containerized environment can draw on code from many different communities and combine it in different ways depending upon the requirements.

The open source development model and open source communities help to:

- Provide the interoperability and workload portability that cloud users need.
- Enable software-defined, cloud-native infrastructures, their applications, and DevOps processes for developing and operating those applications.
- Create the bridges between new infrastructures and workloads and classic IT—for example, by connecting back-end systems to new applications through business rules and message busses.

1 *NTU increases efficiency and performance while saving costs with a hybrid cloud. April 2016.*

- Preserve existing investments while providing IT with the strategic flexibility to deploy on their infrastructure of choice, whether physical servers, legacy virtualization, private clouds, or public clouds.

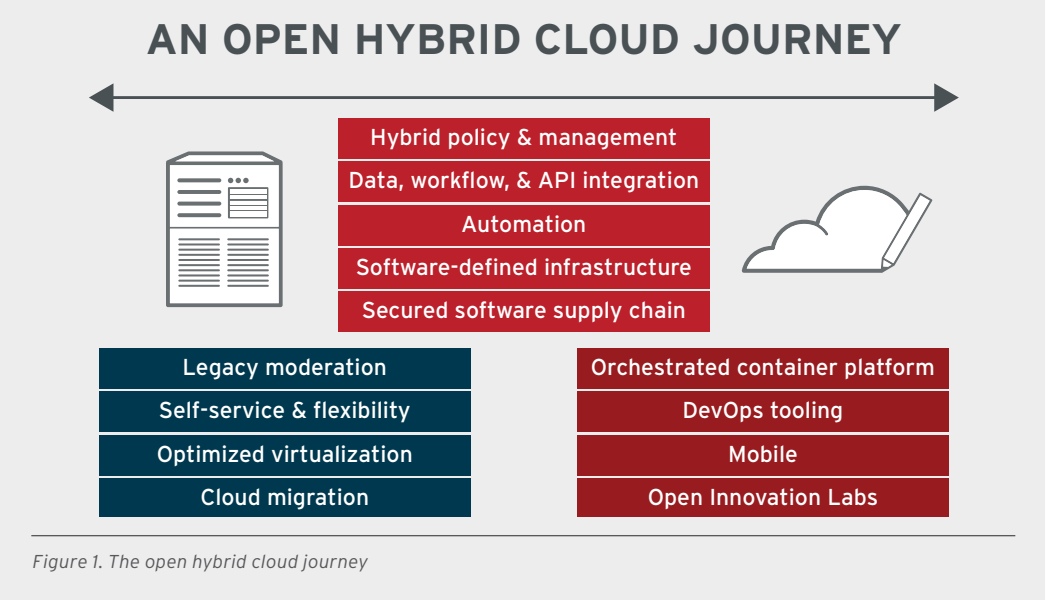

Figure 1. The open hybrid cloud journey

BEYOND OPEN SOURCE IN THE CLOUD

The "open" in open hybrid cloud is about more than open source code. As we have discussed, it is also about engaging with innovative communities. It is about interoperability, workload portability, and strategic flexibility. And it is about making open source suitable for critical deployments through quality assurance and integration, working within upstream projects, and having predictable and stable life-cycle support.

Open source allows adopters to control their particular implementation and does not restrict them to the technology and business roadmap of a specific vendor.

A viable, independent community is the single most important element of many open source projects. Delivering maximum innovation means having the right structures and organization in place to fully take advantage of the open source development model.

Open standards do not necessarily require formal standardization efforts, but they do require a consensus among communities of developers and users. Approaches to interoperability that are not under the control of individual vendors, or tied to specific platforms, offer important flexibility.

Freedom to use intellectual property (IP) is needed to use technology without constraints. Even "reasonable and non-discriminatory" license terms can still require permission or impose other restrictions.

Platform choice lets operations and application development teams use the right infrastructure. Tools like cloud management should not be tied to a specific virtualization or other foundational technology. For example, at one time, managing just physical servers and virtual machines was a reasonable goal for a management product. Then private cloud and public cloud. Then more public clouds. Now containers as well.

Portability can be a tradeoff. Sometimes, using a feature that is specific to a particular public cloud provider is the right business decision. Nonetheless, technologies such as container and cloud management platforms can maximize the degree to which applications and services can be deployed across a variety of infrastructure. And redeployed elsewhere if needs or conditions change.

HOW RED HAT DELIVERS OPEN SOURCE VALUE

At Red Hat, our focus is on making open source technologies consumable and supportable by enterprise IT. Red Hat's business model is 100% open source—no bait-and-switch, and no open core holding back valuable bits as proprietary add-on software.

We collaborate through upstream projects because doing so is at the heart of the economic and business model that makes open source such an effective way to develop software. Working upstream lets Red Hat engage closely with the open source community and influence technology choices in ways that are important to our customers, our partners, and us. It helps ensure that we use the strengths of open source development and maintain the technology expertise to provide fast and knowledgable product support, while also working with the community to encourage innovation.

Red Hat has a well-established process for turning open source projects into enterprise subscription products that satisfy the demands of some of the most challenging and critical applications in markets such as financial services, government, and telecommunications. Red Hat is also focused on creating value through a portfolio of products and an ecosystem of partners.

CONCLUSION

To meet the challenges brought by the digitization of the business, IT needs to simultaneously close three serious gaps. It needs to build a comprehensive cloud-native infrastructure to close the gap between what the business requires and what traditional IT can deliver. It needs to deliver applications, services, and access to infrastructure that is in line with what both customers and employees have come to expect from consumer devices and public cloud services. And it needs to do this iteratively and quickly, while maintaining and connecting back to the classic IT on which core business services are running.

Individual organizations will achieve these various goals in a variety of ways. But the vast majority will do so in a hybrid manner. They will modernize and optimize existing assets to retain and extend their value. They will build and deploy new cloud-native infrastructures to provide the best platform for quickly and iteratively delivering needed business services for internal and external customers. They will use resources from a variety of public clouds.

But making the most effective use of these disparate types of technology means that taking an open approach to cloud is not a nice-to-have for IT organizations. It is a must-have.

ABOUT RED HAT

Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.

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